GUIDANCE ON MACT DEVELOPMENT AND MODEL UNITS

At the November 20, 1997 Incinerator Workgroup (IWG) Meeting I was asked to provide some additional guidance on what the MACT development requirements are. Attached is an attachment from the May 8, 1997 IWG meeting that I hope will satisfy this need. Additionally, I have attached some guidance on model unit development, also originally attached to the May 8 minutes. I have made some minor formatting and wording revisions to these two documents to make them easier to use.

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Example Outline of EPA Steps for Developing a MACT Proposal

I. OUTLINE

A. CHARACTERIZE THE INDUSTRY

1. Determine availability of data
2. Collect data
3. Identify remaining data gaps
4. Conduct site visits/testing

B. DETERMINE MACT

1. Develop preliminary subcategories
2. Develop model plants (model incinerators)
3. Determine MACT floor level of control for category/preliminary subcategories
4. Determine regulatory alternatives
5. Determine environmental and cost impacts of regulatory alternatives on model plants
6. Conduct benefits and economics analyses
7. Select MACT

C. DEVELOP STANDARD FOR PROPOSAL

1. Determine the format of the Standard
2. Determine testing, monitoring, and recordkeeping and reporting requirements
3. Estimate cost of testing, monitoring, and recordkeeping and reporting requirements.
4. Prepare the preamble, regulation, and OMB form 83 for OMB
5. Revise package based on OMB comments
6. Send package to Administrator for signature

II. STEP-BY-STEP SUMMARY

A. CHARACTERIZE THE INDUSTRY

1. Determine availability of data

Description: Determine the types of data that are readily

available and develop schedule for obtaining data.

Steps: Identify sources of data including
- literature
- existing databases
- previous rule-makings
- industry studies

Time required: 1 month

2. Collect data

Description: Collect data to compile into database used for later analyses.

Steps:
a. Collect and compile data identified from A.1.
b. QA data to ensure correct data entry/transfer
c. Identify data gaps
d. Develop survey questionnaires (if needed) to fill in data gaps
e. Send out questionnaire
f. Compile questionnaire responses and QA information
g. Contact facilities to answer response questions
h. Incorporate survey data into database

Time required: 6-12 months

3. Review data and identify remaining data gaps

Description: Review for missing information to determine how well database characterizes industry

Data needed:
- Procedures for reviewing database
- Database from A.2. [Note: Many subcategories can proceed with current database and will not need to wait for survey responses. Others can start with current database but will need to wait for survey results for final review]
- HAP emission information (from STIRS, Utility HAP report, AP-42, GRI, API, etc)

Steps:
a. QA database for accuracy of information
b. Determine HAPs of interest
c. Review emissions information for HAPs of interest

d. Review population database and emission database for gaps in emissions, controls, and process information
e. Determine if site visits or testing can fill data gaps
f. Determine number and location of tests/site visits to be representative

Time required: 2-3 months

4. Conduct site visits/testing

Description: Obtain data to fill in data gaps

Data needed: Results of A.3.f.

Steps:
a. Develop testing protocol
b. Conduct test or site visit
c. Write test report/trip report
d. Incorporate report data into database

Time required: 1 month for site visits, 4 months for testing

[Note: MACT determination (steps B.1 through B.4) may begin concurrently with steps A.3 and A.4 above]

B. DETERMINE MACT

1. Develop preliminary subcategories

Description: Identify any commonalities in the industry where segments may be grouped together. Identify the factors that influence emissions and technical feasibility of control to determine whether different segments should be examined separately (i.e, subcategorized).

Data needed:
- Incinerator designs, waste types, capacities

- General knowledge of pollutants emitted, emission rates, emission controls in use and their effectiveness

Steps:
a. Identify characteristics affecting emissions
b. Determine potential lower size cut-offs

c. Determine other potential exclusions
d. Group segments with similar characteristics

Time required: 3-5 weeks

2. Develop model plants (model incinerators)

Description: Represent the ranges of sizes and types of incinerators in the subcategory for use in calculating costs and emission impacts of controls. Models are typically used when sufficient site-specific information on every plant is not available.

Data needed:

- Incinerator designs, incinerator capacities, control devices/levels, operating hours, waste type/analysis, other fuel, etc. for subcategories
- For economics analysis, type of industry using incinerator, products, plant sizes or production capacities.

Steps:

a. Identify characteristics that would vary significantly from plant to plant
b. Break subcategory into incinerators that would represent the variation of characteristics.

Time required: 1-2 months

3. Determine MACT floor level of control for category/preliminary subcategories

Description: Meet the statutory requirements of MACT standards--the minimum level of control which the regulation might require. Costs and benefits are not considered when developing the MACT floor.

Data needed:

- Controls in database, control requirements from regulations, emission limits

Steps:

a. Identify existing control technologies/control levels/pollution prevention/work practices.
b. Attribute efficiencies (% reduction) or emission limits (concentrations or rates) to the identified control devices/pollution prevention/work practices (for total HAP, and individual HAPs).
c. Determine the MACT floor for existing sources in each subcategory:
   "The average emission limitation achieved by the best performing 12 percent of existing sources..."
d. Determine the MACT floor for new sources in each subcategory:
   "The emission control that is achieved in practice by the best controlled similar source."

e. Document analyses

Time required: 1-2 months

[Note: There are various ways to approach MACT floor determinations (steps c. and d.)]

4. Determine regulatory alternatives

Description: Develop possible levels of control. The first regulatory alternative is the MACT floor. Additional regulatory alternatives are more stringent than the floor.

Data needed:
- Existing level of control
- Potential technologies/techniques that may be used to control emissions and their performance

Steps:
a. Determine the type of regulatory alternative (e.g., a device that achieves better control, control of a larger segment of the population, etc.)
b. Assign regulatory alternatives to model plants.

Time required: 1 month

5. Determine environmental and cost impacts of regulatory alternatives on model plants

Description: Evaluate the impacts of regulatory alternatives on emissions and the costs for implementing the alternatives. Results will be used in the economics and benefits analyses.

Data needed:
- Cost algorithms for control techniques, inputs for algorithms (e.g., flue gas flow rates of model incinerators)
- Emissions information to develop emission factors or emission estimates for model incinerators

Steps:
a. Identify cost procedures/algorithms to calculate capital and annual costs of controls including equipment, installation, O&M, capital recovery, etc.

b. Determine inputs for algorithms (e.g., characteristics of exhaust streams for model incinerators)
c. Develop emission factors relating emissions to model plant variables
d. Identify emissions reduction/limits for regulatory alternatives control techniques
e. Calculate baseline emissions (i.e., emissions with existing controls and regulations) for model plants
f. Calculate emission reductions for model plants for regulatory alternatives
g. Calculate capital and annual costs of regulatory alternatives for model plants
h. Calculate cost-effectiveness ($/Mg emission reduction) of alternatives for model plants
i. Calculate energy requirements of regulatory requirements
j. Calculate other environmental impacts of regulatory alternatives (including water, solid waste, secondary impacts)
k. Calculate national impacts for existing sources by scaling model plant impacts by number of plants, waste burn, throughput, or production rate.
l. Estimate the number of new sources projected to be built over a 5-year period
m. Calculate national impacts for new sources projected over a 5-year period
n. Document analyses in the preamble, technical memos, and other background documentation

Time required: 3-4 months

6. Conduct benefits and economics analyses

Description: Estimate the potential impacts to the national economy and the health effects of the alternatives **[Economic Analyses Workgroup will take the lead]**

Data needed:
- Location (city/state, longitude/latitude, etc) and exposure model inputs (e.g., stack height and velocity, meteorologic information)--often model a range of example plants rather than every plant
- Control costs (from task 6) and additional economic information

Steps:

[Note: See EPA/RTI presentation from March 19 meeting for a full discussion of economics and benefits analyses]

Time required: 4-6 months

7. Select MACT

Description: One of the regulatory alternatives is selected considering the environmental and benefits, as well as the costs and economics analysis. **[Workgroup will recommend to coordinating committee and coordinating committee will recommend to EPA. EPA will make the decision.]**

Data needed:
- Results of benefits/economics analyses

Time required: 1-2 months to develop recommendation and pass through the coordinating committee

1-2 months for EPA management review and decision

C. DEVELOP STANDARD FOR PROPOSAL

1. Determine the format of the Standard (2-3 weeks)
2. Determine testing, monitoring, and recordkeeping and reporting requirements. (1-3 months)
3. Estimate cost of testing, monitoring, and recordkeeping and reporting requirements. (2-4 weeks)
4. Draft sections of the preamble, regulation, and OMB form 83 for OMB. (3-5 months)
5. Revise package based on EPA management review and OMB review. (4-5 months)
6. Send package to Administrator for signature. **[EPA only]**

Summary of Model Unit Development Steps

Model units are be developed to represent segments of the population and are used in performing cost, emission reduction, and other impacts analyses. A reasonable number of models should be developed to represent key differences that have a large influence on emissions, control feasibility, and control costs. However, Work Groups should seek to keep the number of model units manageable by having a single model represent a range of sizes and similar designs.

Key fields of the ICCR database should be reviewed to obtain information needed for model plant development. The types of information used for model unit development include: fuels/waste types combusted, combustor capacity, general design type, operating hours, existing control device, and/or other key characteristics that influence emissions and costs of control. (Note that conversions may need to be done to get capacities or other parameters in common units.)

It is not necessary to have complete information for every combustor in the database to develop model units, as long as the database gives sufficient information to determine the range of capacities, fuels, etc. that should be represented by the models. If specific information (e.g. design information, vent stream characteristics) is needed that is not available in the database, this could be supplemented by manufacturers' information, industry or trade association information, market research databases, plant visits, etc.

Population information is needed to extrapolate model unit impacts to the national level. The database, possibly in conjunction with other sources of information, can be used to estimate the population represented by each model. Again, it is not necessary that every combustion unit be listed in the database to estimate the national population. Additional information could be obtained from previous studies, market research, trade association information, DOE fuel use reports, etc. Or other extrapolation techniques could be used to estimate population. For example, if some states in the ICCR database appear to have very complete population information on a subcategory, the populations in these states might be used extrapolate the likely national population.